

**The Elusive Magic Bullet: The Search for the Perfect Drug.** John Mann. Oxford University Press, New York, 1999.

Humans have been medicating themselves with one substance or another for thousands of years, first tapping into a vast natural arsenal of animal, vegetable, and mineral-based remedies, then creating still more in the chemistry laboratory. Millions of pills and potions later, we have not even a single perfect drug—a drug that can, in Paul Ehrlich's phrase, function as a "magic bullet" against disease, completely safe and completely effective, painlessly speeding through our bodies to vaporize invading organisms or errant cells without disturbing our equilibrium. A cynic might conclude at this point that our search for the magic bullet is as doomed as any alchemist's effort to spin straw into gold. However, the search continues at an ever more frantic pace as sophisticated technology launches increasingly devious and subtle efforts to undermine disease while leaving the patient whole.

John Mann, a professor of organic chemistry at Reading University in Great Britain, has written a readable overview of the last century's achievements in two interrelated categories of drug development: antimicrobial agents and antineoplastic agents. He starts with Paul Ehrlich's antitreponemal arsenicals and ends with the antisense agents now in early clinical trials for the treatment of autoimmune diseases and cancer, covering in the process the development of antibacterial and antiviral agents, vaccines, antimetabolites, and hormone-based antineoplastic agents.

The book is short and well written, linking together the old stories of Jenner, Pasteur, Fleming, and Waksman and placing them into a contemporary context at a nice, brisk pace. Among its strengths are a well-crafted beginning that clarifies the intellectual continuum between the German dye industry of the late 19th century and the beginning of the antibiotic era and a truly gripping overview of the first heady years of penicillin use. The last chapters on the evolution of chemotherapy lead into the genetic basis of tumor biology without missing a beat.

Thus, while the author is clearly an accomplished scientist, an enthusiastic historian,

and a gifted raconteur, he could have used an editor or collaborator with some clinical background. When the discussion ventures from the development of drugs into their use, the text is peppered with factual errors, misstatements, and occasional off-base conclusions. For instance, Mann illustrates a short discussion of serious staphylococcal infections with the case of the puppeteer Jim Henson (who actually died of a fulminant group A streptococcal pneumonia); he misstates the name of the first neuraminidase inhibitor to be marketed for influenza infections (the drug is zanamivir, not anamivir, and warrants nowhere near the degree of enthusiasm lavished on it); he warns that the major toxicity of the tetracycline family of drugs is copious gastrointestinal blood loss (upset, yes; bleeding, no). He states that antibiotics can be purchased over the counter not only in the Third World, but also in the United States—any reader curious to know the source of this last piece of misinformation will be thwarted by the absence of both footnotes and endnotes in this book. The only reference materials cited are "suggestions for further reading" in the back. A good-sized section on the treatment of AIDS is oddly distorted, minimizing the revolution that the protease inhibitors and combination drug regimens have brought to the treatment of the disease and concluding that the future of AIDS treatment "looks increasingly rosy" because of the discovery of the chemokine receptors CCR5 and CXCR4. This view from the chemist's bench, is not one that most clinicians would share.

None of these (or other) misstatements is all that important in itself, but their cumulative effect is to erode some of the reader's confidence in the accuracy of this smooth and entertaining narrative. Perhaps the lesson to be drawn is that, just as the development of the antimicrobial and antineoplastic drugs has been the work of thousands of diverse collaborators, from the much-feted to the entirely unknown, so the telling of their full story requires more than a single person's talents, as multifaceted as they may be.

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